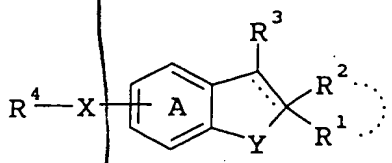
CLAIMS

1. A compound of the formula:



wherein R^1 and R^2 each represents a hydrogen atom or a hydrocarbon group which may be substituted, or R^1 and R^2 form, taken together with the adjacent carbon atom, a 3- to 8-membered carbo or heterocyclic ring which may be substituted;

R^3 represents a hydrogen atom, a lower alkyl which may be substituted or an aromatic group which may be substituted;

R^4 represents (1) an aromatic group which may be substituted, (2) an aliphatic hydrocarbon group substituted by an aromatic group which may be substituted, which hydrocarbon group may be further substituted or (3) an acyl;

X and Y each represents an oxygen atom or a sulfur atom which may be oxidized;

---- represents a single bond or a double bond; and

ring A represents a benzene ring which may be further substituted apart from the group of the formula: $-X-R^4$

wherein each symbol is as defined above,

provided that when X and Y are oxygen atoms and ---- is a single bond, R^4 is not an acyl,

or a salt thereof.

2. A compound of Claim 1, wherein R^1 and R^2 each is (i) a hydrogen atom or

(ii) a C_{1-6} alkyl, C_{2-6} alkenyl, C_{2-6} alkynyl, C_{3-6} cycloalkyl or C_{6-14} aryl group which may be substituted by 1 to 5 substituents selected from the group consisting of (1) halogen atoms, (2) C_{1-3} alkylenedioxy, (3) nitro, (4) cyano, (5) optionally halogenated C_{1-6} alkyl, (6) optionally halogenated C_{2-6} alkenyl, (7)

optionally halogenated C_{2-6} alkynyl, (8) optionally halogenated C_{3-6} cycloalkyl, (9) C_{6-14} aryl, (10) optionally halogenated C_{1-6} alkoxy, (11) optionally halogenated C_{1-6} alkylthio, (12) hydroxy, (13) amino, (14) mono-C_{1-6} alkylamino, (15) mono-C_{6-14} arylamino, (16) di-C_{1-6} alkylamino, (17) di-C_{6-14} arylamino, (18) acyl selected from the group consisting of formyl, carboxy, carbamoyl, C_{1-6} alkyl-carbonyl, C_{3-6} cycloalkyl-carbonyl, C_{1-6} alkoxy-carbonyl, C_{6-14} aryl-carbonyl, C_{7-16} aralkyl-carbonyl, C_{6-14} aryloxy-carbonyl, C_{7-16} aralkyloxy-carbonyl, 5- or 6-membered heterocycle carbonyl, mono-C_{1-6} alkyl-carbamoyl, di-C_{1-6} alkyl-carbamoyl, C_{6-14} aryl-carbamoyl, 5- or 6-membered heterocycle carbamoyl, C_{1-6} alkylsulfonyl, C_{6-14} arylsulfonyl, C_{1-6} alkylsulfinyl and C_{6-14} arylsulfinyl, (19) acylamino selected from the group consisting of formylamino, C_{1-6} alkyl-carboxamido, C_{6-14} aryl-carboxamido, C_{1-6} alkoxy-carboxamido, C_{1-6} alkylsulfonylamino and C_{6-14} arylsulfonylamino, (20) acyloxy selected from the group consisting of C_{1-6} alkyl-carbonyloxy, C_{6-14} aryl-carbonyloxy, C_{1-6} alkoxy-carbonyloxy, mono-C_{1-6} alkyl-carbamoyloxy, di-C_{1-6} alkyl-carbamoyloxy, C_{6-14} aryl-carbamoyloxy and nicotinoyloxy, (21) 5- to 7-membered saturated cyclic amino which may be substituted by 1 to 3 substituents selected from the group consisting of C_{1-6} alkyl, C_{6-14} aryl and 5- to 10-membered aromatic heterocyclic group, (22) 5- to 10-membered aromatic heterocyclic group and (23) sulfo, or R^1 and R^2 form, taken together with the adjacent carbon atom, a C_{3-8} cycloalkane or a 3- to 8-membered heterocyclic ring, each of which may be substituted by 1 to 3 substituents selected from the group consisting of C_{1-6} alkyl, C_{6-14} aryl, C_{7-16} aralkyl, amino, mono-C_{1-6} alkylamino, mono-C_{6-14} arylamino, di-C_{1-6} alkylamino, di-C_{6-14} arylamino and 5- to 10-membered aromatic heterocyclic group;

R^3 is (i) a hydrogen atom,

(ii) a C_{1-6} alkyl which may be substituted by 1 to 5 substituents selected from the group consisting of (1) halogen atoms, (2) C_{1-3} alkylenedioxy, (3) nitro, (4) cyano, (5) optionally halogenated C_{1-6} alkyl, (6) optionally halogenated C_{2-6} alkenyl, (7) optionally halogenated C_{2-6} alkynyl, (8) optionally halogenated C_{3-6} cycloalkyl, (9) C_{6-14} aryl, (10) optionally halogenated C_{1-6} alkoxy, (11) optionally halogenated C_{1-6} alkylthio, (12) hydroxy, (13) amino, (14) mono-C_{1-6} alkylamino, (15) mono-C_{6-14} arylamino, (16) di-C_{1-6} alkylamino, (17) di-C_{6-14} arylamino, (18) acyl selected from the group consisting of formyl, carboxy, carbamoyl, C_{1-6} alkyl-carbonyl, C_{3-6} cycloalkyl-carbonyl, C_{1-6} alkoxy-carbonyl, C_{6-14} aryl-carbonyl, C_{7-16} aralkyl-carbonyl, C_{6-14} aryloxy-carbonyl, C_{7-16} aralkyloxy-carbonyl, 5- or 6-membered heterocycle carbonyl, mono-C_{1-6} alkyl-carbamoyl, di-C_{1-6} alkyl-carbamoyl, C_{6-14} aryl-carbamoyl, 5- or 6-membered heterocycle carbamoyl, C_{1-6} alkylsulfonyl, C_{6-14} arylsulfonyl, C_{1-6} alkylsulfinyl and C_{6-14} arylsulfinyl, (19) acylamino selected from the group consisting of formylamino, C_{1-6} alkyl-carboxamido, C_{6-14} aryl-carboxamido, C_{1-6} alkoxy-carboxamido, C_{1-6} alkylsulfonylamino and C_{6-14} arylsulfonylamino, (20) acyloxy selected from the group consisting of C_{1-6} alkyl-carbonyloxy, C_{6-14} aryl-carbonyloxy, C_{1-6} alkoxy-carbonyloxy, mono-C_{1-6} alkyl-carbamoyloxy, di-C_{1-6} alkyl-carbamoyloxy, C_{6-14} aryl-carbamoyloxy and nicotinoyloxy, (21) 5- to 7-membered saturated cyclic amino which may be substituted by 1 to 3 substituents selected from the group consisting of C_{1-6} alkyl, C_{6-14} aryl and 5- to 10-membered aromatic heterocyclic group, (22) 5- to 10-membered aromatic heterocyclic group and (23) sulfo, or (iii) a C_{6-14} aryl or a 5- to 14-membered aromatic heterocyclic group containing 1 to 4 hetero atoms selected from the group consisting of nitrogen, sulfur and oxygen atoms in addition to carbon atoms, each of which may be substituted by 1 to 3 substituents

selected from the group consisting of (1) halogen atoms, (2) C_{1-3} alkylenedioxy, (3) nitro, (4) cyano, (5) optionally halogenated C_{1-6} alkyl, (6) optionally halogenated C_{2-6} alkenyl, (7) optionally halogenated C_{2-6} alkynyl, (8) optionally halogenated C_{3-6} cycloalkyl, (9) optionally halogenated C_{1-6} alkoxy, (10) optionally halogenated C_{1-6} alkylthio, (11) hydroxy, (12) amino, (13) mono-C_{1-6} alkylamino, (14) di-C_{1-6} alkylamino, (15) 5- to 7-membered saturated cyclic amino which may be substituted by 1 to 3 substituents selected from the group consisting of C_{1-6} alkyl, C_{6-14} aryl and 5- to 10-membered aromatic heterocyclic group, (16) acyl selected from the group consisting of formyl, carboxy, carbamoyl, C_{1-6} alkyl-carbonyl, C_{3-6} cycloalkyl-carbonyl, C_{1-6} alkoxy-carbonyl, C_{6-14} aryl-carbonyl, C_{7-16} aralkyl-carbonyl, C_{6-14} aryloxy-carbonyl, C_{7-16} aralkyloxy-carbonyl, 5- or 6-membered heterocycle carbonyl, mono-C_{1-6} alkyl-carbamoyl, di-C_{1-6} alkyl-carbamoyl, C_{6-14} aryl-carbamoyl, 5- or 6-membered heterocycle carbamoyl, C_{1-6} alkylsulfonyl, C_{6-14} arylsulfonyl, C_{1-6} alkylsulfinyl and C_{6-14} arylsulfinyl, (17) acylamino selected from the group consisting of formylamino, C_{1-6} alkyl-carboxamido, C_{6-14} aryl-carboxamido, C_{1-6} alkoxy-carboxamido, C_{1-6} alkylsulfonylamino and C_{6-14} arylsulfonylamino, (18) acyloxy selected from the group consisting of C_{1-6} alkyl-carbonyloxy, C_{6-14} aryl-carbonyloxy, C_{1-6} alkoxy-carbonyloxy, mono-C_{1-6} alkyl-carbamoyloxy, di-C_{1-6} alkyl-carbamoyloxy, C_{6-14} aryl-carbamoyloxy and nicotinoyloxy, (19) sulfo, (20) C_{6-14} aryl and (21) C_{6-14} aryloxy;

R^4 is (i) a C_{6-14} aryl or a 5- to 14-membered aromatic heterocyclic group containing 1 to 4 hetero atoms selected from the group consisting of nitrogen, sulfur and oxygen atoms in addition to carbon atoms, each of which may be substituted by 1 to 3 substituents selected from the group consisting of (1) halogen atoms, (2) C_{1-3} alkylenedioxy, (3) nitro, (4) cyano, (5) optionally halogenated C_{1-6} alkyl, (6) optionally

halogenated C_{2-6} alkenyl, (7) optionally halogenated C_{2-6} alkynyl, (8) optionally halogenated C_{3-6} cycloalkyl, (9) optionally halogenated C_{1-6} alkoxy, (10) optionally halogenated C_{1-6} alkylthio, (11) hydroxy, (12) amino, (13) mono-C_{1-6} alkylamino, (14) di-C_{1-6} alkylamino, (15) 5- to 7-membered saturated cyclic amino which may be substituted by 1 to 3 substituents selected from the group consisting of C_{1-6} alkyl, C_{6-14} aryl and 5- to 10-membered aromatic heterocyclic group, (16) acyl selected from the group consisting of formyl, carboxy, carbamoyl, C_{1-6} alkyl-carbonyl, C_{3-6} cycloalkyl-carbonyl, C_{1-6} alkoxy-carbonyl, C_{6-14} aryl-carbonyl, C_{7-16} aralkyl-carbonyl, C_{6-14} aryloxy-carbonyl, C_{7-16} aralkyloxy-carbonyl, 5- or 6-membered heterocycle carbonyl, mono-C_{1-6} alkyl-carbamoyl, di-C_{1-6} alkyl-carbamoyl, C_{6-14} aryl-carbamoyl, 5- or 6-membered heterocycle carbamoyl, C_{1-6} alkylsulfonyl, C_{6-14} arylsulfonyl, C_{1-6} alkylsulfinyl and C_{6-14} arylsulfinyl, (17) acylamino selected from the group consisting of formylamino, C_{1-6} alkyl-carboxamido, C_{6-14} aryl-carboxamido, C_{1-6} alkoxy-carboxamido, C_{1-6} alkylsulfonylamino and C_{6-14} arylsulfonylamino, (18) acyloxy selected from the group consisting of C_{1-6} alkyl-carbonyloxy, C_{6-14} aryl-carbonyloxy, C_{1-6} alkoxy-carbonyloxy, mono-C_{1-6} alkyl-carbamoyloxy, di-C_{1-6} alkyl-carbamoyloxy, C_{6-14} aryl-carbamoyloxy and nicotinoyloxy, (19) sulfo, (20) C_{6-14} aryl and (21) C_{6-14} aryloxy, (ii) an aliphatic hydrocarbon group selected form the group consisting of C_{1-6} alkyl, C_{2-6} alkenyl, C_{2-6} alkynyl and C_{3-6} cycloalkyl, which hydrocarbon group substituted by 1 to 3 C_{6-14} aryl or 5- to 14-membered aromatic heterocyclic group containing 1 to 4 hetero atoms selected from the group consisting of nitrogen, sulfur and oxygen atoms in addition to carbon atoms, each of which may be substituted by 1 to 3 substituents selected from the group consisting of (1) halogen atoms, (2) C_{1-3} alkylenedioxy, (3) nitro, (4) cyano, (5) optionally halogenated C_{1-6} alkyl, (6) optionally

halogenated C_{2-6} alkenyl, (7) optionally halogenated C_{2-6} alkynyl, (8) optionally halogenated C_{3-6} cycloalkyl, (9) optionally halogenated C_{1-6} alkoxy, (10) optionally halogenated C_{1-6} alkylthio, (11) hydroxy, (12) amino, (13) mono-C_{1-6} alkylamino, (14) di-C_{1-6} alkylamino, (15) 5- to 7-membered saturated cyclic amino which may be substituted by 1 to 3 substituents selected from the group consisting of C_{1-6} alkyl, C_{6-14} aryl and 5- to 10-membered aromatic heterocyclic group, (16) acyl selected from the group consisting of formyl, carboxy, carbamoyl, C_{1-6} alkyl-carbonyl, C_{3-6} cycloalkyl-carbonyl, C_{1-6} alkoxy-carbonyl, C_{6-14} aryl-carbonyl, C_{7-16} aralkyl-carbonyl, C_{6-14} aryloxy-carbonyl, C_{7-16} aralkyloxy-carbonyl, 5- or 6-membered heterocycle carbonyl, mono-C_{1-6} alkyl-carbamoyl, di-C_{1-6} alkyl-carbamoyl, C_{6-14} aryl-carbamoyl, 5- or 6-membered heterocycle carbamoyl, C_{1-6} alkylsulfonyl, C_{6-14} arylsulfonyl, C_{1-6} alkylsulfinyl and C_{6-14} arylsulfinyl, (17) acylamino selected from the group consisting of formylamino, C_{1-6} alkyl-carboxamido, C_{6-14} aryl-carboxamido, C_{1-6} alkoxy-carboxamido, C_{1-6} alkylsulfonylamino and C_{6-14} arylsulfonylamino, (18) acyloxy selected from the group consisting of C_{1-6} alkyl-carbonyloxy, C_{6-14} aryl-carbonyloxy, C_{1-6} alkoxy-carbonyloxy, mono-C_{1-6} alkyl-carbamoyloxy, di-C_{1-6} alkyl-carbamoyloxy, C_{6-14} aryl-carbamoyloxy and nicotinoyloxy, (19) sulfo, (20) C_{6-14} aryl and (21) C_{6-14} aryloxy, which hydrocarbon group may be further substituted by 1 to 5 substituents selected from the group consisting of (1) halogen atoms, (2) C_{1-3} alkylenedioxy, (3) nitro, (4) cyano, (5) optionally halogenated C_{1-6} alkyl, (6) optionally halogenated C_{2-6} alkenyl, (7) optionally halogenated C_{2-6} alkynyl, (8) optionally halogenated C_{3-6} cycloalkyl, (9) C_{6-14} aryl, (10) optionally halogenated C_{1-6} alkoxy, (11) optionally halogenated C_{1-6} alkylthio, (12) hydroxy, (13) amino, (14) mono-C_{1-6} alkylamino, (15) mono-C_{6-14} arylamino, (16) di-C_{1-6} alkylamino, (17) di-C_{6-14} arylamino, (18) acyl selected from the group

consisting of formyl, carboxy, carbamoyl, C_{1-6} alkyl-carbonyl, C_{3-6} cycloalkyl-carbonyl, C_{1-6} alkoxy-carbonyl, C_{6-14} aryl-carbonyl, C_{7-16} aralkyl-carbonyl, C_{6-14} aryloxy-carbonyl, C_{7-16} aralkyloxy-carbonyl, 5- or 6-membered heterocycle carbonyl, mono-C_{1-6} alkyl-carbamoyl, di-C_{1-6} alkyl-carbamoyl, C_{6-14} aryl-carbamoyl, 5- or 6-membered heterocycle carbamoyl, C_{1-6} alkylsulfonyl, C_{6-14} arylsulfonyl, C_{1-6} alkylsulfinyl and C_{6-14} arylsulfinyl, (19) acylamino selected from the group consisting of formylamino, C_{1-6} alkyl-carboxamido, C_{6-14} aryl-carboxamido, C_{1-6} alkoxy-carboxamido, C_{1-6} alkylsulfonylamino and C_{6-14} arylsulfonylamino, (20) acyloxy selected from the group consisting of C_{1-6} alkyl-carbonyloxy, C_{6-14} aryl-carbonyloxy, C_{1-6} alkoxy-carbonyloxy, mono-C_{1-6} alkyl-carbamoyloxy, di-C_{1-6} alkyl-carbamoyloxy, C_{6-14} aryl-carbamoyloxy and nicotinoyloxy, (21) 5- to 7-membered saturated cyclic amino which may be substituted by 1 to 3 substituents selected from the group consisting of C_{1-6} alkyl, C_{6-14} aryl and 5- to 10-membered aromatic heterocyclic group, (22) 5- to 10-membered aromatic heterocyclic group and (23) sulfo, or

(iii) an acyl of the formula: $-(C=O)-R^5$, $-(C=O)-OR^5$, $-(C=O)-NR^5R^6$, $-(C=S)-NHR^5$, $-SO_2-R^{5a}$ or $-SO-R^{5a}$

wherein R^5 is (a) a hydrogen atom,

(b) a C_{6-14} aryl or a 5- to 14-membered aromatic heterocyclic group containing 1 to 4 hetero atoms selected from the group consisting of nitrogen, sulfur and oxygen atoms in addition to carbon atoms, each of which may be substituted by 1 to 3 substituents selected from the group consisting of (1) halogen atoms, (2) C_{1-3} alkylenedioxy, (3) nitro, (4) cyano, (5) optionally halogenated C_{1-6} alkyl, (6) optionally halogenated C_{2-6} alkenyl, (7) optionally halogenated C_{2-6} alkynyl, (8) optionally halogenated C_{3-6} cycloalkyl, (9) optionally halogenated C_{1-6} alkoxy, (10) optionally halogenated C_{1-6} alkylthio, (11) hydroxy, (12) amino, (13) mono-C_{1-6} alkylamino, (14) di-C_{1-6} alkylamino, (15)

5- to 7-membered saturated cyclic amino which may be substituted by 1 to 3 substituents selected from the group consisting of C_{1-6} alkyl, C_{6-14} aryl and 5- to 10-membered aromatic heterocyclic group, (16) acyl selected from the group consisting of formyl, carboxy, carbamoyl, C_{1-6} alkyl-carbonyl, C_{3-6} cycloalkyl-carbonyl, C_{1-6} alkoxy-carbonyl, C_{6-14} aryl-carbonyl, C_{7-16} aralkyl-carbonyl, C_{6-14} aryloxy-carbonyl, C_{7-16} aralkyloxy-carbonyl, 5- or 6-membered heterocycle carbonyl, mono-C_{1-6} alkyl-carbamoyl, di-C_{1-6} alkyl-carbamoyl, C_{6-14} aryl-carbamoyl, 5- or 6-membered heterocycle carbamoyl, C_{1-6} alkylsulfonyl, C_{6-14} arylsulfonyl, C_{1-6} alkylsulfinyl and C_{6-14} arylsulfinyl, (17) acylamino selected from the group consisting of formylamino, C_{1-6} alkyl-carboxamido, C_{6-14} aryl-carboxamido, C_{1-6} alkoxy-carboxamido, C_{1-6} alkylsulfonylamino and C_{6-14} arylsulfonylamino, (18) acyloxy selected from the group consisting of C_{1-6} alkyl-carbonyloxy, C_{6-14} aryl-carbonyloxy, C_{1-6} alkoxy-carbonyloxy, mono-C_{1-6} alkyl-carbamoyloxy, di-C_{1-6} alkyl-carbamoyloxy, C_{6-14} aryl-carbamoyloxy and nicotinoyloxy, (19) sulfo, (20) C_{6-14} aryl and (21) C_{6-14} aryloxy, or (c) a C_{1-6} alkyl, C_{2-6} alkenyl, C_{2-6} alkynyl or C_{3-6} cycloalkyl group which may be substituted by 1 to 5 substituents selected from the group consisting of (1) C_{6-14} aryl or 5- to 14-membered aromatic heterocyclic group containing 1 to 4 hetero atoms selected from the group consisting of nitrogen, sulfur and oxygen atoms in addition to carbon atoms, each of which may be substituted by 1 to 3 substituents selected from the group consisting of (1') halogen atoms, (2') C_{1-3} alkylenedioxy, (3') nitro, (4') cyano, (5') optionally halogenated C_{1-6} alkyl, (6') optionally halogenated C_{2-6} alkenyl, (7') optionally halogenated C_{2-6} alkynyl, (8') optionally halogenated C_{3-6} cycloalkyl, (9') optionally halogenated C_{1-6} alkoxy, (10') optionally halogenated C_{1-6} alkylthio, (11') hydroxy, (12') amino, (13') mono-C_{1-6} alkylamino, (14') di-C_{1-6} alkylamino, (15') 5- to 7-

membered saturated cyclic amino which may be substituted by 1 to 3 substituents selected from the group consisting of C_{1-6} alkyl, C_{6-14} aryl and 5- to 10-membered aromatic heterocyclic group, (16') acyl selected from the group consisting of formyl, carboxy, carbamoyl, C_{1-6} alkyl-carbonyl, C_{3-6} cycloalkyl-carbonyl, C_{1-6} alkoxy-carbonyl, C_{6-14} aryl-carbonyl, C_{7-16} aralkyl-carbonyl, C_{6-14} aryloxy-carbonyl, C_{7-16} aralkyloxy-carbonyl, 5- or 6-membered heterocycle carbonyl, mono-C_{1-6} alkyl-carbamoyl, di-C_{1-6} alkyl-carbamoyl, C_{6-14} aryl-carbamoyl, 5- or 6-membered heterocycle carbamoyl, C_{1-6} alkylsulfonyl, C_{6-14} arylsulfonyl, C_{1-6} alkylsulfinyl and C_{6-14} arylsulfinyl, (17') acylamino selected from the group consisting of formylamino, C_{1-6} alkyl-carboxamido, C_{6-14} aryl-carboxamido, C_{1-6} alkoxy-carboxamido, C_{1-6} alkylsulfonylamino and C_{6-14} arylsulfonylamino, (18') acyloxy selected from the group consisting of C_{1-6} alkyl-carbonyloxy, C_{6-14} aryl-carbonyloxy, C_{1-6} alkoxy-carbonyloxy, mono-C_{1-6} alkyl-carbamoyloxy, di-C_{1-6} alkyl-carbamoyloxy, C_{6-14} aryl-carbamoyloxy and nicotinoyloxy, (19') sulfo, (20') C_{6-14} aryl and (21') C_{6-14} aryloxy, (2) halogen atoms, (3) C_{1-3} alkylenedioxy, (4) nitro, (5) cyano, (6) optionally halogenated C_{1-6} alkyl, (7) optionally halogenated C_{2-6} alkenyl, (8) optionally halogenated C_{2-6} alkynyl, (9) optionally halogenated C_{3-6} cycloalkyl, (10) optionally halogenated C_{1-6} alkoxy, (11) optionally halogenated C_{1-6} alkylthio, (12) hydroxy, (13) amino, (14) mono-C_{1-6} alkylamino, (15) di-C_{1-6} alkylamino, (16) 5- to 7-membered saturated cyclic amino which may be substituted by 1 to 3 substituents selected from the group consisting of C_{1-6} alkyl, C_{6-14} aryl and 5- to 10-membered aromatic heterocyclic group, (17) acyl selected from the group consisting of formyl, carboxy, carbamoyl, C_{1-6} alkyl-carbonyl, C_{3-6} cycloalkyl-carbonyl, C_{1-6} alkoxy-carbonyl, C_{6-14} aryl-carbonyl, C_{7-16} aralkyl-carbonyl, C_{6-14} aryloxy-carbonyl, C_{7-16} aralkyloxy-carbonyl, 5- or 6-membered heterocycle

carbonyl, mono-C_{1-6} alkyl-carbamoyl, di-C_{1-6} alkyl-carbamoyl, C_{6-14} aryl-carbamoyl, 5- or 6-membered heterocycle carbamoyl, C_{1-6} alkylsulfonyl, C_{6-14} arylsulfonyl, C_{1-6} alkylsulfinyl and C_{6-14} arylsulfinyl, (18) acylamino selected from the group consisting of formylamino, C_{1-6} alkyl-carboxamido, C_{6-14} aryl-carboxamido, C_{1-6} alkoxy-carboxamido, C_{1-6} alkylsulfonylamino and C_{6-14} arylsulfonylamino, (19) acyloxy selected from the group consisting of C_{1-6} alkyl-carbonyloxy, C_{6-14} aryl-carbonyloxy, C_{1-6} alkoxy-carbonyloxy, mono-C_{1-6} alkyl-carbamoyloxy, di-C_{1-6} alkyl-carbamoyloxy, C_{6-14} aryl-carbamoyloxy and nicotinoyloxy and (20) sulfo;

R^{5a} is (a) a C_{6-14} aryl or a 5- to 14-membered aromatic heterocyclic group containing 1 to 4 hetero atoms selected from the group consisting of nitrogen, sulfur and oxygen atoms in addition to carbon atoms, each of which may be substituted by 1 to 3 substituents selected from the group consisting of (1) halogen atoms, (2) C_{1-3} alkylenedioxy, (3) nitro, (4) cyano, (5) optionally halogenated C_{1-6} alkyl, (6) optionally halogenated C_{2-6} alkenyl, (7) optionally halogenated C_{2-6} alkynyl, (8) optionally halogenated C_{3-6} cycloalkyl, (9) optionally halogenated C_{1-6} alkoxy, (10) optionally halogenated C_{1-6} alkylthio, (11) hydroxy, (12) amino, (13) mono-C_{1-6} alkylamino, (14) di-C_{1-6} alkylamino, (15) 5- to 7-membered saturated cyclic amino which may be substituted by 1 to 3 substituents selected from the group consisting of C_{1-6} alkyl, C_{6-14} aryl and 5- to 10-membered aromatic heterocyclic group, (16) acyl selected from the group consisting of formyl, carboxy, carbamoyl, C_{1-6} alkyl-carbonyl, C_{3-6} cycloalkyl-carbonyl, C_{1-6} alkoxy-carbonyl, C_{6-14} aryl-carbonyl, C_{7-16} aralkyl-carbonyl, C_{6-14} aryloxy-carbonyl, C_{7-16} aralkyloxy-carbonyl, 5- or 6-membered heterocycle carbonyl, mono-C_{1-6} alkyl-carbamoyl, di-C_{1-6} alkyl-carbamoyl, C_{6-14} aryl-carbamoyl, 5- or 6-membered heterocycle carbamoyl, C_{1-6}

alkylsulfonyl, C_{6-14} arylsulfonyl, C_{1-6} alkylsulfinyl and C_{6-14} arylsulfinyl, (17) acylamino selected from the group consisting of formylamino, C_{1-6} alkyl-carboxamido, C_{6-14} aryl-carboxamido, C_{1-6} alkoxy-carboxamido, C_{1-6} alkylsulfonylamino and C_{6-14} arylsulfonylamino, (18) acyloxy selected from the group consisting of C_{1-6} alkyl-carbonyloxy, C_{6-14} aryl-carbonyloxy, C_{1-6} alkoxy-carbonyloxy, mono-C_{1-6} alkyl-carbamoyloxy, di-C_{1-6} alkyl-carbamoyloxy, C_{6-14} aryl-carbamoyloxy and nicotinoyloxy, (19) sulfo, (20) C_{6-14} aryl and (21) C_{6-14} aryloxy, or (b) a C_{1-6} alkyl, C_{2-6} alkenyl, C_{2-6} alkynyl or C_{3-6} cycloalkyl group which may be substituted by 1 to 5 substituents selected from the group consisting of (1) a C_{6-14} aryl or 5- to 14-membered aromatic heterocyclic group containing 1 to 4 hetero atoms selected from the group consisting of nitrogen, sulfur and oxygen atoms in addition to carbon atoms, each of which may be substituted by 1 to 3 substituents selected from the group consisting of (1') halogen atoms, (2') C_{1-3} alkylenedioxy, (3') nitro, (4') cyano, (5') optionally halogenated C_{1-6} alkyl, (6') optionally halogenated C_{2-6} alkenyl, (7') optionally halogenated C_{2-6} alkynyl, (8') optionally halogenated C_{3-6} cycloalkyl, (9') optionally halogenated C_{1-6} alkoxy, (10') optionally halogenated C_{1-6} alkylthio, (11') hydroxy, (12') amino, (13') mono-C_{1-6} alkylamino, (14') di-C_{1-6} alkylamino, (15') 5- to 7-membered saturated cyclic amino which may be substituted by 1 to 3 substituents selected from the group consisting of C_{1-6} alkyl, C_{6-14} aryl and 5- to 10-membered aromatic heterocyclic group, (16') acyl selected from the group consisting of formyl, carboxy, carbamoyl, C_{1-6} alkyl-carbonyl, C_{3-6} cycloalkyl-carbonyl, C_{1-6} alkoxy-carbonyl, C_{6-14} aryl-carbonyl, C_{7-16} aralkyl-carbonyl, C_{6-14} aryloxy-carbonyl, C_{7-16} aralkyloxy-carbonyl, 5- or 6-membered heterocycle carbonyl, mono-C_{1-6} alkyl-carbamoyl, di-C_{1-6} alkyl-carbamoyl, C_{6-14} aryl-carbamoyl, 5- or 6-membered heterocycle carbamoyl, C_{1-6}

alkylsulfonyl, C_{6-14} arylsulfonyl, C_{1-6} alkylsulfinyl and C_{6-14} arylsulfinyl, (17') acylamino selected from the group consisting of formylamino, C_{1-6} alkyl-carboxamido, C_{6-14} aryl-carboxamido, C_{1-6} alkoxy-carboxamido, C_{1-6} alkylsulfonylamino and C_{6-14} arylsulfonylamino, (18') acyloxy selected from the group consisting of C_{1-6} alkyl-carbonyloxy, C_{6-14} aryl-carbonyloxy, C_{1-6} alkoxy-carbonyloxy, mono-C_{1-6} alkyl-carbamoyloxy, di-C_{1-6} alkyl-carbamoyloxy, C_{6-14} aryl-carbamoyloxy and nicotinoyloxy, (19') sulfo, (20') C_{6-14} aryl and (21') C_{6-14} aryloxy, (2) halogen atoms, (3) C_{1-3} alkylenedioxy, (4) nitro, (5) cyano, (6) optionally halogenated C_{1-6} alkyl, (7) optionally halogenated C_{2-6} alkenyl, (8) optionally halogenated C_{2-6} alkynyl, (9) optionally halogenated C_{3-6} cycloalkyl, (10) optionally halogenated C_{1-6} alkoxy, (11) optionally halogenated C_{1-6} alkylthio, (12) hydroxy, (13) amino, (14) mono-C_{1-6} alkylamino, (15) di-C_{1-6} alkylamino, (16) 5- to 7-membered saturated cyclic amino which may be substituted by 1 to 3 substituents selected from the group consisting of C_{1-6} alkyl, C_{6-14} aryl and 5- to 10-membered aromatic heterocyclic group, (17) acyl selected from the group consisting of formyl, carboxy, carbamoyl, C_{1-6} alkyl-carbonyl, C_{3-6} cycloalkyl-carbonyl, C_{1-6} alkoxy-carbonyl, C_{6-14} aryl-carbonyl, C_{7-16} aralkyl-carbonyl, C_{6-14} aryloxy-carbonyl, C_{7-16} aralkyloxy-carbonyl, 5- or 6-membered heterocycle carbonyl, mono-C_{1-6} alkyl-carbamoyl, di-C_{1-6} alkyl-carbamoyl, C_{6-14} aryl-carbamoyl, 5- or 6-membered heterocycle carbamoyl, C_{1-6} alkylsulfonyl, C_{6-14} arylsulfonyl, C_{1-6} alkylsulfinyl and C_{6-14} arylsulfinyl, (18) acylamino selected from the group consisting of formylamino, C_{1-6} alkyl-carboxamido, C_{6-14} aryl-carboxamido, C_{1-6} alkoxy-carboxamido, C_{1-6} alkylsulfonylamino and C_{6-14} arylsulfonylamino, (19) acyloxy selected from the group consisting of C_{1-6} alkyl-carbonyloxy, C_{6-14} aryl-carbonyloxy, C_{1-6} alkoxy-carbonyloxy, mono-C_{1-6} alkyl-carbamoyloxy, di-C_{1-6} alkyl-

carbamoyloxy, C_{6-14} aryl-carbamoyloxy and nicotinoyloxy and (20) sulfo; and

R^6 is a hydrogen atom or a C_{1-6} alkyl; and

ring A is a benzene ring which may be further substituted by 1 to 3 substituents selected from the group consisting of (1) halogen atoms, (2) C_{1-3} alkylenedioxy, (3) nitro, (4) cyano, (5) optionally halogenated C_{1-6} alkyl, (6) optionally halogenated C_{2-6} alkenyl, (7) optionally halogenated C_{2-6} alkynyl, (8) optionally halogenated C_{3-6} cycloalkyl, (9) optionally halogenated C_{1-6} alkoxy, (10) optionally halogenated C_{1-6} alkylthio, (11) hydroxy, (12) amino, (13) mono-C_{1-6} alkylamino, (14) di-C_{1-6} alkylamino, (15) 5- to 7-membered saturated cyclic amino which may be substituted by 1 to 3 substituents selected from the group consisting of C_{1-6} alkyl, C_{6-14} aryl and 5- to 10-membered aromatic heterocyclic group, (16) acyl selected from the group consisting of formyl, carboxy, carbamoyl, C_{1-6} alkyl-carbonyl, C_{3-6} cycloalkyl-carbonyl, C_{1-6} alkoxy-carbonyl, C_{6-14} aryl-carbonyl, C_{7-16} aralkyl-carbonyl, C_{6-14} aryloxy-carbonyl, C_{7-16} aralkyloxy-carbonyl, 5- or 6-membered heterocycle carbonyl, mono-C_{1-6} alkyl-carbamoyl, di-C_{1-6} alkyl-carbamoyl, C_{6-14} aryl-carbamoyl, 5- or 6-membered heterocycle carbamoyl, C_{1-6} alkylsulfonyl, C_{6-14} arylsulfonyl, C_{1-6} alkylsulfinyl and C_{6-14} arylsulfinyl, (17) acylamino selected from the group consisting of formylamino, C_{1-6} alkyl-carboxamido, C_{6-14} aryl-carboxamido, C_{1-6} alkoxy-carboxamido, C_{1-6} alkylsulfonylamino and C_{6-14} arylsulfonylamino, (18) acyloxy selected from the group consisting of C_{1-6} alkyl-carbonyloxy, C_{6-14} aryl-carbonyloxy, C_{1-6} alkoxy-carbonyloxy, mono-C_{1-6} alkyl-carbamoyloxy, di-C_{1-6} alkyl-carbamoyloxy, C_{6-14} aryl-carbamoyloxy and nicotinoyloxy, (19) sulfo, (20) C_{6-14} aryl and (21) C_{6-14} aryloxy.

3. A compound of Claim 1, wherein R^1 and R^2 each is a C_{1-6} alkyl which may be substituted, or R^1 and R^2 form, taken together with the adjacent carbon atom, a 3- to

8-membered carbo or heterocyclic ring which may be substituted.

4. A compound of Claim 1, wherein R^3 is an aromatic group which may be substituted.

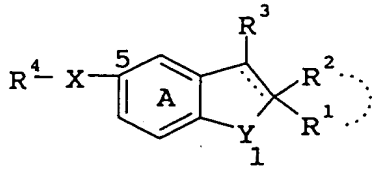
5. A compound of Claim 1, wherein R^4 is (i) an aliphatic hydrocarbon group substituted by an aromatic group which may be substituted, which hydrocarbon group may be further substituted or (ii) an acyl.

6. A compound of Claim 1, wherein X is an oxygen atom.

7. A compound of Claim 1, wherein Y is an oxygen atom.

8. A compound of Claim 7, wherein a group of the formula: $-X-R^4$ is substituted on the 5-position of the benzofuran ring.

9. A compound of Claim 1, which is a compound of the formula:



wherein each symbol is as defined in Claim 1, or a salt thereof.

10. A compound of Claim 1, wherein R^1 and R^2 each is a C_{1-6} alkyl which may be substituted by 1 to 3 substituents selected from the group consisting of (1) C_{6-14} aryl, (2) C_{1-6} alkoxy, (3) C_{1-6} alkylthio, (4) hydroxy, (5) amino, (6) mono-C_{1-6} alkylamino, (7) mono-C_{6-14} arylamino, (8) di-C_{1-6} alkylamino, (9) di-C_{6-14} arylamino, (10) carboxy, (11) C_{1-6} alkylsulfonyl, (12) C_{6-14} arylsulfonyl, (13) C_{1-6} alkylsulfinyl, (14) C_{6-14} arylsulfinyl and (15) 5- to 7-membered saturated cyclic amino which may be substituted by 1 to 3 substituents selected from the group consisting of C_{1-6} alkyl, C_{6-14} aryl and 5- to 10-membered aromatic group, or R^1 and R^2 form, taken together with the adjacent carbon atom, a 3- to 8-membered carbo or heterocyclic ring which may be substituted by 1 to 3 substituents

selected ~~form~~ from the group consisting of C_{1-6} alkyl, C_{6-14} aryl, C_{7-16} aralkyl and 5- to 10-membered aromatic heterocyclic group;

R^3 is a phenyl, 1-naphthyl, 2-naphthyl, 2-thienyl, 3-thienyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, 2-quinolyl, 3-quinolyl, 1-isoquinolyl, 1-indolyl, 2-indolyl or 2-benzothiazolyl group, each of which may be substituted by 1 to 3 substituents selected from the group consisting of (1) halogen atoms, (2) C_{1-6} alkyl, (3) C_{1-6} alkoxy, (4) mono-C_{1-6} alkylamino, (5) di-C_{1-6} alkylamino and (6) 5- to 7-membered saturated cyclic amino which may be substituted by 1 to 3 substituents selected ~~form~~ from the group consisting of C_{1-6} alkyl, C_{6-14} aryl and 5- to 10-membered aromatic group;

R^4 is (i) C_{1-6} alkyl substituted by a phenyl, 1-naphthyl, 2-naphthyl, 2-thienyl, 3-thienyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, 2-quinolyl, 3-quinolyl, 1-isoquinolyl, 1-indolyl, 2-indolyl or 2-benzothiazolyl group, each of which may be substituted by 1 to 3 substituents selected from the group consisting of (1) halogen atoms, (2) C_{1-6} alkyl, (3) C_{1-6} alkoxy, (4) hydroxy, (5) amino, (6) mono-C_{1-6} alkylamino, (7) di-C_{1-6} alkylamino, (8) carboxy and (9) 5- to 7-membered saturated cyclic amino which may be substituted by 1 to 3 substituents selected ~~form~~ from the group consisting of C_{1-6} alkyl, C_{6-14} aryl and 5- to 10-membered aromatic group, which C_{1-6} alkyl may be further substituted by carboxy or C_{1-6} alkoxy-carbonyl, or

(ii) a C_{1-6} alkyl-carbonyl, C_{3-6} cycloalkyl-carbonyl, C_{6-14} aryl-carbonyl or C_{7-16} aralkyl-carbonyl group, each of which may be substituted by 1 to 3 substituents selected from the group consisting of halogen atoms, C_{1-6} alkyl, C_{1-6} alkoxy, hydroxy, amino, mono-C_{1-6} alkylamino, di-C_{1-6} alkylamino and carboxy;

X is an oxygen atom;

Y is an oxygen atom; and

ring A is a benzene ring which may be further substituted by 1 to 3 substituents selected from the group consisting of halogen atoms, optionally halogenated C_{1-6} alkyl, optionally halogenated C_{1-6} alkoxy, amino, mono-C_{1-6} alkylamino and di-C_{1-6} alkylamino.

11. A compound of Claim 1, wherein R^1 and R^2 each is a C_{1-6} alkyl which may be substituted by 1 to 3 substituents selected from the group consisting of C_{6-14} aryl, C_{1-6} alkoxy, C_{1-6} alkylthio, hydroxy, amino, mono-C_{1-6} alkylamino, mono-C_{6-14} arylamino, di-C_{1-6} alkylamino, di-C_{6-14} arylamino, carboxy, C_{1-6} alkylsulfonyl, C_{6-14} arylsulfonyl, C_{1-6} alkylsulfinyl and C_{6-14} arylsulfinyl, or

R^1 and R^2 form, taken together with the adjacent carbon atom, a piperidine which may be substituted by 1 to 3 substituents selected ~~form~~ from the group consisting of C_{1-6} alkyl, C_{6-14} aryl and C_{7-16} aralkyl;

R^3 is a phenyl which may be substituted by 1 to 3 substituents selected from the group consisting of halogen atoms, C_{1-6} alkyl, C_{1-6} alkoxy, amino, mono-C_{1-6} alkylamino and di-C_{1-6} alkylamino;

R^4 is (i) C_{1-6} alkyl substituted by a phenyl or pyridyl, each of which may be substituted by 1 to 3 substituents selected from the group consisting of halogen atoms, C_{1-6} alkyl, C_{1-6} alkoxy, hydroxy, amino, mono-C_{1-6} alkylamino, di-C_{1-6} alkylamino and carboxy, or

(ii) an acyl of the formula: $-(C=O)-R^{5'}$ wherein $R^{5'}$ is a phenyl or phenyl-C_{1-6} alkyl, each of which may be substituted by 1 to 3 substituents selected from the group consisting of halogen atoms, C_{1-6} alkyl, C_{1-6} alkoxy, hydroxy, amino, mono-C_{1-6} alkylamino, di-C_{1-6} alkylamino and carboxy;

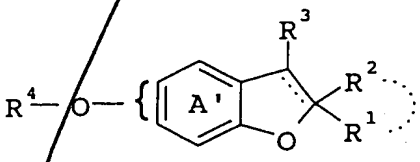
X is an oxygen atom;

Y is an oxygen atom; and

ring A is a benzene ring which may be further

substituted by 1 to 3 substituents selected from the group consisting of halogen atoms, optionally halogenated C_{1-6} alkyl, optionally halogenated C_{1-6} alkoxy, amino, mono-C_{1-6} alkylamino and di-C_{1-6} alkylamino.

12. A compound of Claim 1 which is a compound of the formula:

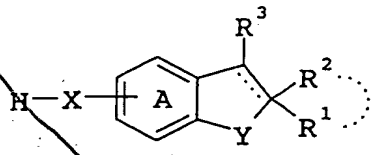


wherein R^1 and R^2 each is C_{1-6} alkyl which may be substituted by 6-membered saturated cyclic amino substituted by a phenyl, or
R^1 and R^2 form, taken together with the adjacent carbon atom, a piperidine substituted by a C_{1-6} alkyl or a C_{7-16} aralkyl;
R^3 is (i) a hydrogen atom, or
(ii) a phenyl which may be substituted by 1 to 3 substituents selected from the group consisting of (1) C_{1-6} alkyl, (2) di-C_{1-6} alkylamino and (3) 6-membered saturated cyclic amino which may be substituted by a C_{1-6} alkyl,
R^4 is (i) a phenyl which may be substituted by 1 to 3 substituents selected from the group consisting of nitro and C_{1-6} alkyl-carboxamido, (ii) a C_{1-6} alkyl or C_{2-6} alkenyl group substituted by 1 to 3 of phenyl, quinolyl or pyridyl, each of which may be substituted by 1 to 3 substituents selected from the group consisting of C_{1-6} alkoxy, C_{1-6} alkylthio, C_{1-6} alkoxy-carbonyl, C_{1-6} alkylsulfonyl and C_{1-6} alkylsulfinyl, which C_{1-6} alkyl or C_{2-6} alkenyl group may be further substituted by a phenyl, carboxy or C_{1-6} alkoxy-carbonyl, or
(iii) an acyl of the formula: $-(C=O)-R^{5''}$
wherein $R^{5''}$ is phenyl substituted by a C_{1-6} alkoxy; and

ring A' is a benzene ring which may be further substituted by 1 to 3 C_{1-6} alkyl.

13. A compound of Claim 1 which is 3-(4-isopropylphenyl)-5-(4-methoxybenzyloxy)-2,2,4,6,7-pentamethyl-2,3-dihydrobenzofuran, 3-(4-isopropylphenyl)-2,4,6,7-tetramethylbenzofuran-5-yl 4-methoxybenzoate, 3-(4-isopropylphenyl)-5-(4-methoxybenzyloxy)-2,4,6,7-tetramethylbenzofuran, 3-(4-isopropylphenyl)-5-(4-methoxybenzyloxy)-1',4,6,7-tetramethylspiro[benzofuran-2(3H),4'-piperidine], or a salt thereof.

14. A process for producing a compound of Claim 1, which comprises reacting a compound of the formula:



wherein each symbol is as defined in Claim 1, or a salt thereof with a compound of the formula: R^4-L wherein L represents a leaving group and R^4 is as defined in Claim 1, or salt thereof.

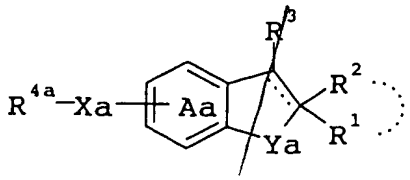
15. A pharmaceutical composition which comprises a compound of Claim 1.

16. A composition of Claim 15 which is an agent for suppressing neurodegeneration.

17. A composition of Claim 15 which is an agent for suppressing β-amyloid toxicity.

18. A composition of Claim 15 which is an agent for preventing and/or treating neurodegenerative diseases.

19. An agent for preventing and/or treating neurodegenerative diseases which comprises a compound of the formula:

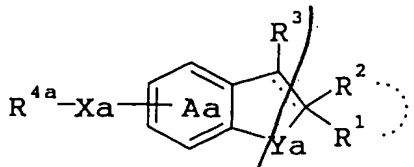


wherein R^1 and R^2 each represents a hydrogen atom or a hydrocarbon group which may be substituted, or R^1 and R^2 form, taken together with the adjacent carbon atom, a 3- to 8-membered carbo or heterocyclic ring which may be substituted;
R^3 represents a hydrogen atom, a lower alkyl which may be substituted or an aromatic group which may be substituted;
R^{4a} represents an aromatic group which may be substituted, an aliphatic hydrocarbon group which may be substituted or an acyl;
Xa represents an oxygen atom or a sulfur atom which may be oxidized;
Ya represents an oxygen atom, a sulfur atom which may be oxidized or an imino which may be substituted;
---- represents a single bond or a double bond;
ring Aa represents a benzene ring which may be further substituted apart from (i) the group of the formula: $-Xa-R^{4a}$ wherein each symbol is as defined above, and (ii) an amino which may be substituted,
provided that when Xa and Ya are oxygen atoms and ---- is a single bond, R^4 is not an acyl,
or a salt thereof.

20. An agent of Claim 19 which is an agent for suppressing β-amyloid toxicity.

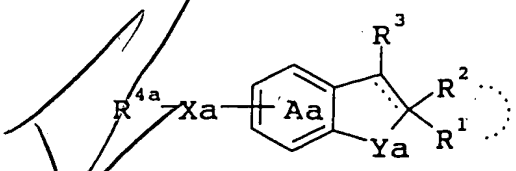
21. An agent of Claim 19 which is an agent for ~~preventing and/or treating neurodegenerative diseases~~.

22. A method for suppressing neurodegeneration in a mammal, which comprises administering to said mammal an effective amount of a compound of the formula:



wherein R^1 and R^2 each represents a hydrogen atom or a hydrocarbon group which may be substituted, or R^1 and R^2 form, taken together with the adjacent carbon atom, a 3- to 8-membered carbo or heterocyclic ring which may be substituted;
R^3 represents a hydrogen atom, a lower alkyl which may be substituted or an aromatic group which may be substituted;
R^{4a} represents an aromatic group which may be substituted, an aliphatic hydrocarbon group which may be substituted or an acyl;
Xa represents an oxygen atom or a sulfur atom which may be oxidized;
Ya represents an oxygen atom, a sulfur atom which may be oxidized or an imino which may be substituted;
---- represents a single bond or a double bond;
ring Aa represents a benzene ring which may be further substituted apart from (i) the group of the formula: $-Xa-R^{4a}$ wherein each symbol is as defined above, and (ii) an amino which may be substituted,
provided that when Xa and Ya are oxygen atoms and ---- is a single bond, R^4 is not an acyl,
or a pharmaceutically acceptable salt thereof with a pharmaceutically acceptable excipient, carrier or diluent.

23. ~~Use of~~ A method of curing a compound of the formula:



wherein R^1 and R^2 each represents a hydrogen atom or a hydrocarbon group which may be substituted, or

R^1 and R^2 form, taken together with the adjacent carbon atom, a 3- to 8-membered carbo or heterocyclic ring which may be substituted;
R^3 represents a hydrogen atom, a lower alkyl which may be substituted or an aromatic group which may be substituted;
R^{4a} represents an aromatic group which may be substituted, an aliphatic hydrocarbon group which may be substituted or an acyl;
Xa represents an oxygen atom or a sulfur atom which may be oxidized;
Ya represents an oxygen atom, a sulfur atom which may be oxidized or an imino which may be substituted;
---- represents a single bond or a double bond;
ring Aa represents a benzene ring which may be further substituted apart from (i) the group of the formula: $-Xa-R^{4a}$ wherein each symbol is as defined above, and (ii) an amino which may be substituted,
provided that when Xa and Ya are oxygen atoms and ---- is a single bond, R^4 is not an acyl,
or a salt thereof for manufacturing a pharmaceutical composition for suppressing neurodegeneration.